CLAIMS:

1. A method of obtaining a leukocyte lysate comprising RNA comprising fractionating leukocytes from whole blood using a leukocyte depletion matrix and lysing the fractionated leukocytes to obtain a lysate comprising RNA.

2. The method of claim 1, wherein the leukocytes are comprised on the matrix at the time they are lysed.

3. The method of claim 1, wherein the leukocytes are flushed from the matrix prior to lysis.

4. The method of claim 2, wherein the leukocyte comprising matrix is stored for a period of time prior to lysis of the leukocytes.

5. The method of claim 1, wherein the fractionated leukocytes are contacted with a lysis solution.

6. The method of claim 5, wherein the lysis solution comprises a detergent.

7. The method of claim 6, wherein the detergent is Triton X-100, Tween-20, SDS (sodium dodecyl sulfate), sarcosyl, or deoxycholic acid.

8. The method of claim 5, wherein the lysis solution contains a chaotropic agent.

9. The method of claim 8, wherein the chaotropic agent is a guanidinium salt.

10. The method of claim 9, wherein the guanidinium salt is guanidinum thiocyanate.

11. The method of claim 5, wherein the lysis solution comprises a ribonuclease inhibitor.

12. The method of claim 5, wherein the lysis solution comprises a protease.

13. The method of claim 12, wherein the protease is proteinase K.

14. The method of claim 1, further comprising extracting the RNA from the lysate.

15. The method of claim 14, wherein extracting the RNA is performed via an organic extraction.

16. The method of claim 15, wherein the organic extraction is a phenol/chloroform extraction.

17. The method of claim 14, further comprising extracting RNA and DNA from the lysate.

18. The method of claim 1, comprising, prior to lysis, treating the fractionated leukocytes with an RNA preservation composition comprising a salt that infiltrates the leukocytes and increases the stability of the RNA compared to the RNA in cells not treated with the preservation composition.

19. The method of claim 18, wherein the salt is a sulfate salt.

20. The method of claim 19, wherein the salt is ammonium sulfate.

21. The method of claim 18, wherein the final salt concentration in the preservation composition is between 10 g/100 ml and a saturating concentration.

22. The method of claim 20, wherein the salt is present in the preservation composition at a final concentration of between 20 g/100 ml and the saturating concentration of the salt.

23. The method of claim 20, wherein the salt is present in the preservation composition at a final concentration of between 30 g/100 ml and 80 g/100 ml.

24. The method of claim 18, wherein the RNA preservation composition comprises at least two salts.

25. The method of claim 24, wherein the total salt concentration is present in the preservation composition at a final concentration of between 20 g/100 ml and 100 g/100 ml.

26. The method of claim 18, wherein the fractionated leukocytes are comprised on the leukocyte depletion matrix and the matrix is contacted with the RNA preservation composition.

27. The method of claim 18, further comprising extracting RNA from the fractionated leukocytes with an organic extraction.

28. The method of claim 27, wherein the extracted RNA has less DNA contamination than would RNA extracted from fractionated leukocytes that were not treated with the RNA preservation medium.

29. The method of claim 1, further comprising treating the fractionated leukocytes with a solution to reduce reticulocyte contamination.

30. The method of claim 29, wherein the solution is a RBC elution buffer.

31. The method of claim 29, wherein the solution is a RBC lysis solution.

32. The method of claim 31, wherein the RBC lysis solution is a water or ammonium chloride lysis solution.

33. The method of claim 1, further defined as comprising:
fractionating leukocytes from blood by capturing them with a leukocyte depletion matrix;
lysing the fractionated leukocytes to produce a lysate;
extracting the lysate with an organic solution to form organic and aqueous phases;
separating the organic and aqueous phases; and
isolating RNA from the aqueous phase.

34. The method of claim 1, further defined as comprising:
fractionating leukocytes from blood by capturing them with a leukocyte depletion matrix;
treating the fractionated leukocytes with an RNA preservation composition comprising a salt that infiltrates the leukocytes, increasing the stability of the RNA;
lysing the fractionated leukocytes to produce a lysate;
extracting the lysate with an organic solution to form organic and aqueous phases;
separating the organic and aqueous phases; and

isolating RNA from the aqueous phase.

35. The method of claim 1, further defined as comprising:
fractionating leukocytes from blood by capturing them with a leukocyte depletion matrix;
treating the fractionated leukocytes with an RNA preservation composition comprising a salt that infiltrates the leukocytes, increasing the stability of the RNA;
lysing the fractionated leukocytes to produce a lysate; and
isolating RNA from the lysate.

36. The method of claim 1, further defined as comprising:
fractionating leukocytes from blood by capturing them with a leukocyte depletion matrix;
lysing the fractionated leukocytes to produce a lysate; and
isolating RNA from the lysate.

37. The method of claim 1, further defined as comprising:
fractionating leukocytes from blood by capturing them with a leukocyte depletion matrix;
treating the fractionated leukocytes with a solution to reduce reticulocyte contamination;
lysing the fractionated leukocytes to produce a lysate;
extracting the lysate with an organic solution to form organic and aqueous phases;
separating the organic and aqueous phases; and
isolating RNA from the aqueous phase.

38. The method of claim 1, further defined as comprising:
fractionating leukocytes from blood by capturing them with a leukocyte depletion matrix;
treating the fractionated leukocytes with a solution to reduce reticulocyte contamination;
treating the fractionated leukocytes with an RNA preservation composition comprising a salt that infiltrates the leukocytes, increasing the stability of the RNA;
lysing the fractionated leukocytes to produce a lysate;
extracting the lysate with an organic solution to form organic and aqueous phases;
separating the organic and aqueous phases; and
isolating RNA from the aqueous phase.

39. The method of claim 1, further comprising assaying for the presence or quantity of one or more RNAs in the lysate.

40. The method of claim 39, wherein assaying comprises a Northern blot, RNase protection assay, hybridization reaction, microarray analysis, or reverse transcriptase-polymerase chain reaction analysis.

41. The method of claim 40, wherein assaying comprises a reverse transcriptase-polymerase chain reaction further defined as real-time RT-PCR or endpoint RT-PCR.

42. The method of claim 40, wherein assaying comprises a microarray analysis.

43. The method of claim 42, wherein the microarray analysis comprises the use of a cDNA array, spotted oligonucleotide array, or *in-situ* synthesized oligonucleotide array.

44. A kit for extracting total RNA from leukocytes comprising:
a leukocyte depletion matrix; and
a leukocyte lysis solution.

45. The kit of claim 44, wherein the leukocyte depletion matrix is comprised in a carrier adapted to allow blood to be passed through the matrix during use.

46. The kit of claim 45, wherein the carrier is adapted to be fitted to a syringe.

47. The kit of claim 44, further defined as adapted to function in a manner that allows whole blood to be moved from a closed container through the matrix and then, as leukocyte-depleted blood, into a further closed container.

48. The kit of claim 44, further comprising a RBC lysis solution and/or a RBC elution buffer.

49. The kit of claim 44, further comprising an RNA preservation composition comprising a salt that infiltrates leukocytes and increases the stability of the RNA in the leukocytes.

50. The kit of claim 44, further comprising an organic extraction reagent.

51. The kit of claim 50, further comprising a solid-phase extraction matrix and reagents for washing the matrix to remove impurities before elution of the RNA.